

----- the newsletter of the Sinclair Computer Users Society -----  
**SINCUS NEWS**  
 1229 Rhodes Road  
 Johnson City, New York 13790  
 ----- since 1982 -----

Here's 1990 - WOW only 10 more years until the year 2000, remember what home computers looked like in 1980? Try and imagine what we'll be using 10 years from now.

January Meet is going to be in Owego, details are being worked out. I will contact all local members for location and transportation arrangements. PAH

Final chapter of Ray Byler's Catalog of the 2068 and Spectrum ROMs, cross referenced alphabetically and by address. This was quite an undertaking on Ray's part, and I hope there are some who can use this reference source. We have all four directories on an Oliger disc, 5.25" DDDS, 40 Track, as Mscript files. Available for \$3.00 PP care of this newsletter.

Final issue of the Harrisburg Area Timex Users Group Newsletter was received this month (Dec). I met Dave Bennett at the CapitalFEST and some of his members, so it is difficult to say Adios amigos to a great bunch of people. Basically due to a lack of member support, they decided to pull the plug.

One bit of News from them...Cambridge (Sinclair) is coming out with a 3.5 lb MSDOS laptop with 3.5" drives and an optional 20 or 30 Meg Hard Drive. The price is said to be very reasonable. Due about mid 1990. (??WHAT sinclair going mainstream??)

With this issue, we welcome Warren Fricke of Depew, NY and his column on BASIC programming. This effort on Warren's part could be met with some questions or comments on your part. While his programming is on the 2068, most also pertains to the 81/1000 and 1500.

Hi and thanks for renewing to Stuart W. Walton, Rowley MA and James T. Wilson, Akron OH. Look on the mailing label, "Last Issue" means that this is your subscription expired.

Our local group project on building external 128K or 256K RAM is off to a big start, the group now has a bare board from Larken, and Don Lamien is bring in his board to the next meet - chip costs, group buys and hard/soft ware will be hashed about. Due to the variety of 2068 equipment hanging off the expansion bus, a one size fits all type device is needed.

page 1 - 2.....NEWS	+	-- Meeting DATES -- 1990 --
page 3 - 4.....Don's 1000 tips	+	----- 7pm Vestal Library -----
page 5 - 14.....Ray Byler's 2068/Spec ROM	+	JAN 17 Wednesday at DWEGO
page 15 - 16.....Warren Fricke's NOT	+	FEB 21 Wednesday
page 17 .....Lambert's tape solutions	+	MAR 21 Wednesday
page 18.....News and Club policy	+	Note: Meeting room or date maybe
	+	changed due to construction
Happy NEW YEAR, may you get wiser not older	+	* WINTER months ahead, meeting will *
happier, not heavier and enjoy your	+	** be Cancelled if there is a ***
TS computers thru out the New Year!	+	***** SNOW Emergency *****

## S.N.U.G.

Well, complaining about the lack of news from S.N.U.G. has gotten me and others a four page letter from Mel Nathanson (founder). I am not going to try to copy word for word the whole letter, (it is in the December 1989, issue of Computer Shopper) but will attempt to condense it to half a page. I note that the Harrisburg (PA) TSUG newsletter (Nov. issue) has the letter completely reproduced.

Mel has noticed the nasty words and implied nasty words written by me and others. His letter is intended to answer the nasties whatever they are. SNUG most prominent function would be the facilitation of the interchange of information. "We are geared toward the maintainance and betterment of the Sinclair community through information." They were offered a magazine, lock, stock and barrel, and after much discussion felt they weren't up to maintaining the established standards and so declined the responsibility. Personnel problems were detailed, problems with volunteers not living up to their word, and others taking advantage of their situation. Four different individuals have attempted a newsletter for SNUG. Much time and dicussion went into the LOOKS of the publication, and little on the content. New information was the goal of each issue, but little if any was coming in. The call for new volunteers to accept and DO the assignments relate to establishing a TAX Exemption Status, an Election Committee and help with the software library, typists to compile databases, contacts to meet former soft/hardware houses to see if anything can be donate to public domain. Many volunteers can cut the job down to a few hours per individual. Mel then discussed his own attempts to sell his employer on the Z88 and of family medical and personal problems. Computer Shopper's column on More Timex Sinclair by Michael O'Brien got much attention with a resulting backlog of replies. Basil Wentworth, Paul Holgrem and Frank Davis of the Indiana TSUG are currently carrying the ball for SNUG. All dues paid in so far, are good until January 1991. If you feel SNUG has not lived up to your expectations, Treasurer John Cushran, will refund your membership. Only address was on the envelope, S.N.U.G. 7515 Abordale Drive, Port Richey, FL 34668-2205. SO if YOU want to see S.N.U.G. succeed, the YOU must volunteer to DO something.

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My condensation of the four page letter in effect amounts to an editorial, I must pick and choose what I want this article to say. Well that's what editors do, some will publish all, some none and others, somewhere in between.

My impression of S.N.U.G is less than good. Why? Well, besides wanting to duplicate what is already being done by all the other TSUGs, what has been done? What is going to be done? And who is going to do it? What counts in this world is the deed not the intent. In the Timex-Sinclair world if you want something done, do it. Don't hold your breath waiting for volunteers, they are few and over worked as it is. And if you have a committee, disband it, put every member to work, and never hold a committee meeting, for every idea will be talked to death.

At the CapitalFEST about 50 or so people from all over North America hoped to hear some positive information about S.N.U.G., and all we heard was election results and personal problems. After two hours of hearing individual hopes and dispare I walked out, as I see no one individual strong enough to lead such diversity of opinions. There were opposing views for every idea, and the loudest drowned out the rest. S.N.U.G. is too little, too late. If TSers want to devote their energy to S.N.U.G. and see it succeed, fine but get going and do something now, deliver the goods, and keep moving forward.

If you can get a hold of the letter and form your own opinion, write and tell Mel Nathanson, include a SASE as a courtesy if you want a reply. Replies sent here will be in the next issue of this newsletter. Promises were made, money was collected and more promises were made and where is S.N.U.G. today? - P.A.H. Editor

ZX81/TS1000 Tips - by Don Lamen, SINCUS

17. In the TS1000 Timex Manual there are the following mnemonic errors :

a) From 00 hex. to 07 hex. -- after CB the manual has ric (b to a). It should be rlc (b to a).

b) At 6B hex. -- after ED the manual has ld de, (NN). It should be ld hl, (NN).

18. The Instruction Codes not included in the Timex Manual are the DD Codes and the FD Codes. The DD Codes pertain to the IX Register, while the FD Codes pertain to the IY register. These codes are 2, 3 or 4 bytes long and are as follows:

hex code	mnemonic	!	hex code	mnemonic
DD09	ADD IX, BC	!	FD09	ADD IY, BC
DD19	ADD IX, DE	!	FD19	ADD IY, DE
DD21nnmm	LD IX, mn	!	FD21nnmm	LD IY, mn
DD22qqpp	LD (pq), IX	!	FD22qqpp	LD(pq), IY
DD23	INC IX	!	FD23	INC IY
DD29	ADD IX, IX	!	FD29	ADD IY, IY
DD2Aqqpp	LD IX, (pq)	!	FD2Aqqpp	LD IY, (pq)
DD2B	DEC IX	!	FD2B	DEC IY
DD34dd	INC (IX+d)	!	FD34dd	INC (IY+d)
DD35dd	DEC (IX+d)	!	FD35dd	DEC (IY+d)
DD36ddnn	LD (IX+d), n	!	FD36ddnn	LD (IY+d), n
DD39	ADD IX, SP	!	FD39	ADD IY, SP
DD46dd	LD B, (IX+d)	!	FD46dd	LD B, (IY+d)
DD4Edd	LD C, (IX+d)	!	FD4Edd	LD C, (IY+d)
DD56dd	LD D, (IX+d)	!	FD56dd	LD D, (IY+d)
DD5Edd	LD E, (IX+d)	!	FD5Edd	LD E, (IY+d)
DD66dd	LD H, (IX+d)	!	FD66dd	LD H, (IY+d)
DD6Edd	LD L, (IX+d)	!	FD6Edd	LD L, (IY+d)
DD70dd	LD (IX+d), B	!	FD70dd	LD (IY+d), B
DD71dd	LD (IX+d), C	!	FD71dd	LD (IY+d), C
DD72dd	LD (IX+d), D	!	FD72dd	LD (IY+d), D
DD73dd	LD (IX+d), E	!	FD73dd	LD (IY+d), E
DD74dd	LD (IX+d), H	!	FD74dd	LD (IY+d), H
DD75dd	LD (IX+d), L	!	FD75dd	LD (IY+d), L
DD77dd	LD (IX+d), A	!	FD77dd	LD (IY+d), A
DD7Edd	LD A, (IX+d)	!	FD7Edd	LD A, (IY+d)
DD86dd	ADD A, (IX+d)	!	FDB6dd	ADD A, (IY+d)
DD8Edd	ADC A, (IX+d)	!	FDBEdd	ADC A, (IY+d)
DD96dd	SUB (IX+d)	!	FD96dd	SUB (IY+d)
DD9Edd	SBC (IX+d)	!	FD9Edd	SBC (IY+d)
DDA6dd	AND (IX+d)	!	FDA6dd	AND (IY+d)
DDAEdd	XOR (IX+d)	!	FDAEdd	XOR (IY+d)
DDB6dd	OR (IX+d)	!	FDB6dd	OR (IY+d)
DDBEdd	CP (IX+d)	!	FDBEdd	CP (IY+d)
DDE1	POP IX	!	FDE1	POP IY
DDE3	EX (SP), IX	!	FDE3	EX (SP), IY
DDE5	PUSH IX	!	FDE5	PUSH IY
DDE9	JP (IX)	!	FDE9	JP (IY)
DDEB	EX DE, IX	!	FDEB	EX DE, IY
DDF9	LD SP, IX	!	FD9F	LD SP, IY

These are the rest of the Bit Codes :

DDCBdd06	RLC (IX+d)	!	FDCBdd06	RLC (IY+d)
DDCBdd0E	RRC (IX+d)	!	FDCBdd0E	RRC (IY+d)
DDCBdd16	RL (IX+d)	!	FDCBdd16	RL (IY+d)
DDCBdd1E	RR (IX+d)	!	FDCBdd1E	RR (IY+d)
DDCBdd26	SLA (IX+d)	!	FDCBdd26	SLA (IY+d)
DDCBdd2E	SRA (IX+d)	!	FDCBdd2E	SRA (IY+d)
---		!	---	
DDCBdd3E	SRL (IX+d)	!	FDCBdd3E	SRL (IY+d)
DDCBdd46	BIT 0, (IX+d)	!	FDCBdd46	BIT 0, (IY+d)
DDCBdd4E	BIT 1, (IX+d)	!	FDCBdd4E	BIT 1, (IY+d)
DDCBdd56	BIT 2, (IX+d)	!	FDCBdd56	BIT 2, (IY+d)
DDCBdd5E	BIT 3, (IX+d)	!	FDCBdd5E	BIT 3, (IY+d)
DDCBdd66	BIT 4, (IX+d)	!	FDCBdd66	BIT 4, (IY+d)
DDCBdd6E	BIT 5, (IX+d)	!	FDCBdd6E	BIT 5, (IY+d)
DDCBdd76	BIT 6, (IX+d)	!	FDCBdd76	BIT 6, (IY+d)
DDCBdd7E	BIT 7, (IX+d)	!	FDCBdd7E	BIT 7, (IY+d)
DDCBdd86	RES 0, (IX+d)	!	FDCBdd86	RES 0, (IY+d)
DDCBdd8E	RES 1, (IX+d)	!	FDCBdd8E	RES 1, (IY+d)
DDCBdd96	RES 2, (IX+d)	!	FDCBdd96	RES 2, (IY+d)
DDCBdd9E	RES 3, (IX+d)	!	FDCBdd9E	RES 3, (IY+d)
DDCBddA6	RES 4, (IX+d)	!	FDCBddA6	RES 4, (IY+d)
DDCBddAE	RES 5, (IX+d)	!	FDCBddAE	RES 5, (IY+d)
DDCBddB6	RES 6, (IX+d)	!	FDCBddB6	RES 6, (IY+d)
DDCBddBE	RES 7, (IX+d)	!	FDCBddBE	RES 7, (IY+d)
DDCBddC6	SET 0, (IX+d)	!	FDCBddC6	SET 0, (IY+d)
DDCBddCE	SET 1, (IX+d)	!	FDCBddCE	SET 1, (IY+d)
DDCBddD6	SET 2, (IX+d)	!	FDCBddD6	SET 2, (IY+d)
DDCBddDE	SET 3, (IX+d)	!	FDCBddDE	SET 3, (IY+d)
DDCBddE6	SET 4, (IX+d)	!	FDCBddE6	SET 4, (IY+d)
DDCBddEE	SET 5, (IX+d)	!	FDCBddEE	SET 5, (IY+d)
DDCBddF6	SET 6, (IX+d)	!	FDCBddF6	SET 6, (IY+d)
DDCBddFE	SET 7, (IX+d)	!	FDCBddFE	SET 7, (IY+d)

Key:

- dd The displacement byte.  
d Displacement with the Range of -129 to 127, like the e in the instruction JR e.  
mm The High byte.  
nn The Low byte.  
pp The High Address byte.  
qq The Low Address byte.  
m,n,p & q The value of the corresponding byte.  
IX The Index Register X.  
IY The Index Register Y.

- Note: 1. In the DD & FD instructions the displacement byte is always the Third byte of the instruction.  
2. These are Z-80 instructions and work with any computer based on this microprocessor.  
3. The Index Registers are used by the computer's interpreter routines, therefore, save these registers someplace before using them. Be sure to replace them before returning to BASIC.

The following is the last part of a four part catalog of the Spectrum and TS2068 ROMs and comes to you through the efforts of:

Ray Byler, June 1988, Fort Riley, Kansas

TS2068 ROM ENTRY POINTS INDEXED BY ADDRESS

BASIC MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0000	00000	PLUGIN	0000	00000	START
0008	00008	(Print Error)	0008	00008	ERROR-1
0010	00016	WRCH	0010	00016	PRINT-A-1
0018	00024	(Get Character)	0018	00024	GET-CHAR
001C	00028	(Tst Character)	001C	00028	TEST-CHAR
0020	00032	(Get Nxt Char)	0020	00032	NEXT-CHAR
0028	00040	(FP Calculator)	0028	00040	FP-CALC
0030	00048	(BC Workspaces)	0030	00048	BC-SPACES
0038	00056	(Maskable Int)	0038	00056	MASK-INT
0048	00072	(Keyboard Int)	0048	00072	KEY-INT
004F	00079	PHLAF	004F	00079	(Pop HL & AF)
0053	00083	(Error-2)	0053	00083	ERROR-2
0055	00085	LE3	0055	00085	ERROR-3
0066	00102	(NMI Ext Int)	0066	00102	RESET
0074	00116	NEXTCH	0074	00116	CH-ADD+1
0077	00119	NC_HL	0077	00119	TEMP-PTR1
0078	00120	TC_HL	0078	00120	TEMP-PTR2
007D	00125	(Control Chrs)	007D	00125	SKIP-OVER
0098	00152	TOKENS	0095	00149	(Token Table)

KSCAN MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0227	00551	KSCAN	0205	00517	(Key Tables)
0268	00616	(Ex Mode Ltrs)	022C	00556	(Ex Mode Ltrs)
02B0	00688	K_SCAN	028E	00654	KEY-SCAN
02BB	00696	(Scanning Loop)	0296	00662	KEY-LINE
02E1	00737	UPD_K	02BF	00703	KEYBOARD
0317	00791	(New Key)	02F1	00753	K-NEW
0336	00822	(Key Repeat Fn)	0310	00784	K-REPEAT
035C	00860	K_BASE	031E	00798	K-TEST
0371	00881	CHCODE	0333	00819	K-DECODE
03F3	01011	PARP	03B5	00949	BEEPER
0436	01078	BEEP	03F8	01016	BEEP
04AA	01194	(Report B)	046C	01132	REPORT-B
04AC	01196	(Tone Table)	046E	01134	(Tone Table)

IO\_1 MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0500	01280	SENDTV	09F4	02548	PRINT-OUT
0528	01320	(Ctrl Char Tbl)	0A11	02577	(Ctrl Char Tbl)
053A	01338	P_LFT	0A23	02595	PO-BACK1
0554	01364	P_RT	0A3D	02621	PO-RIGHT
0566	01382	P_NL	0A4F	02639	PO-ENTER
0576	01398	(Print Comma)	0A5F	02655	PO-COMMA

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0580	01408	(Print a "?")	0A69	02665	PO-QUEST
0584	01412	(Ink - Over)	0A6D	02669	PO-TV-2
05B2	01458	SET_AT	0A9B	02715	(AT Ctrl Char)
05F0	01520	(Print Chars)	0AD9	02777	PO-ABLE
05F3	01523	STTVCU	0ADC	02780	PO-STORE
0607	01543	(Save Lwr Scrn)	0AF0	02800	PO-ST-E
0613	01555	(Save Prnt Bfr)	0AFC	02812	PO-ST-PR
061A	01562	LDTVCU	0B03	02819	PO-FETCH
0634	01588	(P-Bfr Fetch)	0B1D	02845	PO-F-PR
063B	01595	(Print Chars)	0B24	02852	PO-ANY
069A	01690	(Expand Chars)	0B65	02917	PO-CHAR
06B4	01716	(Print a Char)	0B7F	02943	PR-ALL
0708	01800	(Adjst fr Prtr)	0BD3	03027	PO-ALL-6
0710	01808	ATTBYT	0BDB	03035	PO-ATTR
073F	01855	PUTMES	0C0A	03082	PO-MSG
0776	01910	PR_TV2	0C3B	03131	PO-SAVE
077C	01916	(Search Table)	0C41	03137	PO-SEARCH
0790	01936	TVFUL?	0C55	03157	PO-SCR
07C1	01985	ERR5	0C86	03206	REPORT-5
0833	02099	(Scroll? Msg)	0CF8	03320	(Scroll? Msg)
0888	02184	R_ATT5	0D4D	03405	TEMPS
08A6	02214	K_CLS	0D6B	03435	CLS
08A9	02217	CLLHS	0D6E	03438	CLS-LOWER
08EA	02282	CLS	0DAF	03503	CL-ALL
0914	02324	SETCUR	0DD9	03545	CL-SET
0914	02324	SETTVC	0DD9	03545	CL-SET
0939	02361	SCRL	0DFE	03582	CL-SC-ALL
097F	02431	CLS_B	0E44	03652	CL-LINE
09C3	02499	(Cl Attributes)	0E88	03720	CL-ATTR
09D6	02518	(Get DF Address)	0E9B	03739	CL-ADDR

## IO\_2 MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0A02	02562	K_DUMP	0EAC	03756	COPY
0A23	02595	DUMPPR	0ECD	03789	COPY-BUFF
0A35	02613	CLPR	0EDF	03807	CLEAR-PRB
0A4A	02634	PRSCAN	0EF4	03828	COPY-LINE
0AB2	02690	EDIT_K	0F2C	03884	EDITOR
0AE7	02791	INSA	0F81	03969	ADD-CHAR
0B06	02822	(Edit Keys Tbl)	0FA0	04000	(Edit Keys Tbl)
0B0F	02831	(Do Edit)	0FA9	04009	ED-EDIT
0B59	02905	(Cursor Down)	0FF3	04083	ED-DOWN
0B6D	02925	(Cursor Left)	1007	04103	ED-LEFT
0B72	02930	(Cursor Right)	100C	04108	ED-RIGHT
0B7B	02939	DELSYM	1015	04117	ED-DELETE
0BB4	02948	(End Edit)	101E	04126	ED-IGNORE
0B8A	02954	(Restre ERR-SP)	1024	04132	ED-ENTER
0B97	02967	(Put Cursor)	1031	04145	ED-EDGE
0BBF	03007	(Cursor Up)	1059	04185	ED-UP
0BD7	03031	(Sym & Grph Cd)	1076	04214	ED-SYMBOL

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0BE5	03045	(Edit Error)	107F	04223	ED-ERROR
0BFD	03069	DEL_K	1097	04247	CLEAR-SP
0C0E	03086	IN_K	10AB	04264	KEY-INPUT
0C83	03203	ECHO	111D	04381	ED-COPY
0CF6	03318	(Loc Wrk Space)	1190	04496	SET-HL
0D0D	03341	DESLUG	11A7	04519	REMOVE-FP

## EDIT MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0D1D	03357	K_NEW	11B7	04535	NEW
0D31	03377	INIT	11CB	04555	START/NEW
0D40	03392	(Check Memory)	11DA	04570	RAM-CHECK
0D7F	03455	NEW	1219	04633	RAM-SET
0E2B	03624	(Edit Mode Lp)	12A2	04770	MAIN-EXEC
0E2F	03631	LED1B	12A9	04777	MAIN-1
0E8D	03725	LED4	1303	04867	MAIN-4
0F65	03941	RPTMSG	1391	05009	(Report Msgs)
1118	04376	(Timex Logo)	15C9	05577	(Sinclair Logo)
1158	04440	(Add BASIC Line	155D	05469	MAIN-ADD
11AA	04522	CHINIT	15AF	05551	(Init Chan Info
11BF	04543	(Invl'd I/O Dev)	15C4	05572	REPORT-J
11C1	04545	SMINIT	15C6	05574	(Init Strm Data
11CF	04559	RDCH	15D4	05588	WAIT-KEY
11E1	04577	INCH	15E6	05606	INPUT-AD
11EA	04586	PUTDIG	15EF	05615	OUT-CODE
11ED	04589	SENDCH	15F2	05618	PRINT-A-2
1230	04656	SELECT	1601	05633	CHAN-OPEN
123D	04669	ERRO	160E	05646	REPORT-D
1248	04680	SEL_HL	1615	05653	CHAN-FLAG
1293	04755	(Channel Flags)	162D	05677	(Chan Code Tbl)
129A	04762	(Set K Flags)	1634	05684	CHAN-K
12AB	04776	(Set S Flags)	1642	05698	CHAN-S
12B3	04787	(Set P Flags)	164D	05709	CHAN-P
12BB	04792	INS1	1652	05714	ONE-SPACE
12BB	04795	INSERT	1655	05717	MAKE-ROOM
12CA	04810	REMGSZ	1664	05732	POINTERS
131E	04894	(Find Line No.)	168F	05775	LINE-ZERO
1324	04900	GET_LN	1695	05781	LINE-NO
132D	04909	LCU2	169E	05790	RESERVE
133F	04927	CLEL	16B0	05808	SET-MIN
134E	04942	X_CALC	16BF	05823	SET-WORK
1354	04948	RESET	16C5	05829	SET-STK
1363	04963	X_T_HL	16D4	05844	REC-EDIT
136B	04971	SEARCH	16DC	05852	INDEXER
1374	04980	SRCHSC	-----	-----	-----

## CHANS MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
139F	05023	CLOSE	16E5	05861	CLOSE
13A8	05032	RSTSTR	16EB	05867	(Make Strm Dt=0
13BE	05054	CLCHAN	1701	05889	CLOSE-2
1407	05127	(Clse Strm Tbl)	1716	05910	(Clse Strm Tbl)
140D	05133	(Close Strm Sub	171C	05916	CLOSE-STR
140F	05135	(Test Strm No.)	171E	05918	STR-DATA
142A	05162	OPEN	1736	05942	OPEN
1465	05221	OPCHAN	175D	05981	OPEN-2
14C7	05319	(Opn Strm Tbl)	177A	06010	(Opn Strm Tbl)
14CE	05326	(Open K Strm)	1781	06017	OPEN-K
14D2	05330	(Open S Stream)	1785	06021	OPEN-S
14D6	05334	(Open P Stream)	1789	06025	OPEN-P

## LIST MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
14E1	05345	LIST	1795	06037	AUTO-LIST
1541	05441	K_LLST	17F5	06133	LLIST
1545	05445	K_LIST	17F9	06137	LIST
15A1	05537	PUT_SR	1855	06229	OUT-LINE
15AC	05548	LPO	1860	06240	(LD D,0)
15C9	05577	PUT	187D	06269	OUT-LINE2
1602	05634	(Skip Over No.)	18B6	06326	NUMBER
160D	05645	FLASHA	18C1	06337	OUT-FLASH
162D	05677	PR_CUR	18E1	06369	OUT-CURS
165B	05723	NEXT_L	190F	06415	LN-FETCH
1668	05736	DE_HL	191C	06428	LN-STORE
1671	05745	(Prnt Char/Tkn)	1925	06437	OUT-SP-2
1676	05750	(Add Spaces/No)	192A	06442	OUT-SP-ND
1683	05763	(Print Line)	1937	06455	OUT-CHAR
16D6	05846	FIND_L	196E	06510	LINE-ADDR
16E8	05864	CP_BC	1980	06528	CP-LINES
16F0	05872	SUBLIN	1988	06536	(Fnd Stmt Sub)
16F3	05875	SUBLN1	198B	06539	EACH-STMT
1720	05920	RECLEN	1988	06584	NEXT-ONE
1745	05957	(Dif of Length)	19DD	06621	DIFFER
174D	05965	DEL_DE	19E5	06629	RECLAIM-1
1750	05968	DELREC	19E8	06632	RECLAIM-2
1768	05992	LINEND	19FB	06651	E-LINE-ND
1788	06024	PUT_BC	1A1B	06683	OUT-NUM-1
1795	06037	PUT_LN	1A28	06696	OUT-NUM-2
17B5	06069	(Bank Switch Cd	----	----	-----
17CF	06095	GETAL	----	----	-----
17EA	06122	AR_LN	----	----	-----
17FF	06143	AR_NXT	----	----	-----
18C6	06342	AROS	----	----	-----



## SYNTAX MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
1945	06469	(Cmd Offsets)	1A48	06728	(Cmd Offsets)
19E0	06624	TEMP38	1ADF	06879	P-SAVE
19E1	06625	TEMP39	1AE0	06880	P-LOAD
1A27	06695	SYNTAX	1B17	06935	LINE-SCAN
1A44	06724	LS4	1B28	06952	STMT-LOOP
1A95	06805	(Get Cmd Class)	1B52	06994	SCAN-LOOP
1AB2	06834	(Chk for Sprtr)	1B6F	07023	SEPARATOR
1AB9	06841	ENDSTT	1B76	07030	STMT-RET
1ADB	06872	EXECUTE	1B8A	07050	LINE-RUN
1AEC	06892	(Fnd Adrs Newln)	1B9E	07070	LINE-NEW
1B00	06912	(Rem Command)	1BB2	07090	REM
1B09	06921	(Ftch Add Nxtln)	1BB3	07091	LINE-END
1B15	06933	(Fnd # Newline)	1BBF	07103	LINE-USE
1B27	06951	(Set Nxtln use)	1BD1	07121	NEXT-LINE
1B44	06980	END?	1BEE	07150	CHECK-END
1B4A	06986	ENDTEM	1BF4	07156	STMT-NEXT
1B64	07012	(Cmd Class Tbl)	1C01	07169	(Cmd Class Tbl)
1B70	07024	(Class 3 Cnds)	1C0D	07181	CLASS-03
1B79	07033	(Jmp to TADDR)	1C16	07190	JUMP-C-R
1B82	07042	TEM1	1C1F	07199	CLASS-01
1B91	07057	ERR2	1C2E	07214	REPORT-2
1BBC	07100	LT22	1C59	07257	VAL-FET-2
1BDC	07132	DYADIC	1C79	07279	NEXT-2NUM
1BE5	07141	TEM6	1C82	07298	EXPT-1NUM
1BED	07149	SYNERR	1C8A	07306	REPORT-C
1BEF	07151	TEM10	1C8C	07308	EXPT-EXP
1C49	07241	OPTND	1CDE	07390	FETCH-NUM
1C51	07249	STK_0	1CE6	07398	USE-ZERO
1C59	07257	STOP	1CEE	07406	STOP
1C5B	07259	(If Command)	1CF0	07408	IF
1C78	07288	FOR	1D03	07427	FOR
1D28	07464	SKIP	1D86	07558	LOOK-PROG
1D55	07509	NEXT	1DAB	07595	NEXT
1D96	07574	(Read after 1st	1DEC	07660	READ-3
1D97	07575	READ	1DED	07661	READ
1E82	07810	DATA	1E27	07719	DATA
1E9D	07837	(Restore Comman	1E42	07746	RESTORE
1ECA	07882	RESTBC	1E45	07749	REST-RUN
1ED4	07892	RAND	1E4F	07759	RANDOMIZE
1EE4	07908	CONT	1E5F	07775	CONTINUE
1EF1	07921	JUMP	1E67	07783	GO-TO
1EFD	07933	GOTO_2	1E73	07795	GO-TO-2
1F04	07940	(Out Command)	1E7A	07802	OUT
1F0A	07946	(Poke Command)	1E80	07808	POKE
1F1E	07966	FIX_U1	1E94	07828	FIND-INT1
1F23	07971	FIX_U	1E99	07833	FIND-INT2
1F29	07977	ERRB	1E9F	07839	REPORT-B
1F2B	07979	(Run Command)	1EA1	07841	RUN
1F36	07990	CLEAR	1EAC	07852	CLEAR
1F39	07993	CLR_BC	1EAF	07855	CLEAR-RUN

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0580	01408	(Print a "?")	0A69	02665	PO-QUEST
0584	01412	(Ink - Over)	0A6D	02669	PO-TV-2
05B2	01458	SET_AT	0A9B	02715	(AT Ctrl Char)
05F0	01520	(Print Chars)	0AD9	02777	PO-ABLE
05F3	01523	STTVCU	0ADC	02780	PO-STORE
0607	01543	(Save Lwr Scrn)	0AF0	02800	PO-ST-E
0613	01555	(Save Prnt Bfr)	0AFC	02812	PO-ST-PR
061A	01562	LDTVCU	0B03	02819	PO-FETCH
0634	01588	(P-Bfr Fetch)	0B1D	02845	PO-F-PR
063B	01595	(Print Chars)	0B24	02852	PO-ANY
069A	01690	(Expand Chars)	0B65	02917	PO-CHAR
06B4	01716	(Print a Char)	0B7F	02943	PR-ALL
0708	01800	(Adjst fr Prtr)	0BD3	03027	PO-ALL-6
0710	01808	ATTBYT	0BDB	03035	PO-ATTR
073F	01855	PUTMES	0C0A	03082	PO-MSG
0776	01910	PR_TV2	0C3B	03131	PO-SAVE
077C	01916	(Search Table)	0C41	03137	PO-SEARCH
0790	01936	TVFUL?	0C55	03157	PO-SCR
07C1	01985	ERR5	0C86	03206	REPORT-5
0833	02099	(Scroll? Msg)	0CF8	03320	(Scroll? Msg)
08BB	02184	R_ATT5	0D4D	03405	TEMPS
08A6	02214	K_CLS	0D6B	03435	CLS
08A9	02217	CLLHS	0D6E	03438	CLS-LOWER
08EA	02282	CLS	0DAF	03503	CL-ALL
0914	02324	SETCUR	0DD9	03545	CL-SET
0914	02324	SETTVC	0DD9	03545	CL-SET
0939	02361	SCRL	0DFE	03582	CL-SC-ALL
097F	02431	CLS_B	0E44	03652	CL-LINE
09C3	02499	(Cl Attributes)	0E88	03720	CL-ATTR
09D6	02518	(Get DF Adres)	0E9B	03739	CL-ADDR

## ID\_2 MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
0A02	02562	K_DUMP	0EAC	03756	COPY
0A23	02595	DUMPPR	0ECD	03789	COPY-BUFF
0A35	02613	CLPR	0EDF	03807	CLEAR-PRB
0A4A	02634	PRSCAN	0EF4	03828	COPY-LINE
0AB2	02690	EDIT_K	0F2C	03884	EDITOR
0AE7	02791	INSA	0F81	03969	ADD-CHAR
0B06	02822	(Edit Keys Tbl)	0FA0	04000	(Edit Keys Tbl)
0B0F	02831	(Do Edit)	0FA9	04009	ED-EDIT
0B59	02905	(Cursor Down)	0FF3	04083	ED-DOWN
0B6D	02925	(Cursor Left)	1007	04103	ED-LEFT
0B72	02930	(Cursor Right)	100C	04108	ED-RIGHT
0B7B	02939	DELSYM	1015	04117	ED-DELETE
0B84	02948	(End Edit)	101E	04126	ED-IGNORE
0B8A	02954	(Restre ERR-SP)	1024	04132	ED-ENTER
0B97	02967	(Put Cursor)	1031	04145	ED-EDGE
0BBF	03007	(Cursor Up)	1059	04185	ED-UP
0BD7	03031	(Sym & Grph Cd)	1076	04214	ED-SYMBOL

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
2679	09849	CIRCLE	2320	08992	CIRCLE
26DB	09947	DRAW	2382	09090	DRAW
2810	10256	DRAW_L	24B7	09399	DRAW-LINE
2813	10259	DRAWLN	24BA	09402	(Compare X&Y)

EXPRN MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
2854	10324	EXPRN	24FB	09467	SCANNING
2889	10377	INTPT?	2530	09520	SYNTAX-Z
288E	10382	F_SCRN	2535	09525	S-SCRN\$-S
28D7	10455	F_ATTR	2580	09600	S-ATTR-S
28FB	10488	(Stick Command)	-----	-----	-----
2934	10548	(Free Command)	-----	-----	-----
296D	10605	(Scanning Func)	25AF	09647	S-U-PLUS
29B6	10678	RND	25F8	09720	S-RND
29E5	10725	F_PI	2627	09767	S-PI
29F2	10738	F_INKY	2634	09780	S-INKEY\$
2A87	10887	(Test Variable)	26C9	09929	S-LETTER
2C69	11369	NXT_HL	28AB	10411	FN-SKPOVR

IDENT MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
2C70	11376	FIND_N	28B2	10418	LOOK-VARS
2D54	11604	GET_EL	2996	10646	STK-VAR
2E10	11792	SLICER	2A52	10834	SLICING
2E70	11888	PSHSTR	2AB2	10930	STK-STO-\$
2E74	11892	PAEDCB	2AB6	10934	STK-STORE
2EBD	11965	LET	2AFF	11007	LET
2F17	12055	L_NUM	2B59	11097	L-NUMERIC
2FAF	12207	POPSTR	2BF1	11249	STK-FETCH
2FC0	12224	DIM	2C02	11266	DIM
3046	12358	ALNUM?	2C88	11400	ALPHANUM
304B	12363	ALPHA?	2C8D	11405	ALPHA

INOUT MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
3059	12377	STKUSN	2C9B	11419	DEC-TO-FP
30D9	12505	DIGIT?	2D1B	11547	NUMERIC
30E6	12518	STK_A	2D28	11560	STACK-A
30E9	12521	STK_BC	2D2B	11563	STACK-BC
30F9	12537	ININT	2D3B	11579	INT-TO-FP
310D	12557	KEY	2D4F	11599	E-TO-FP
313D	12605	LDDE	2D7F	11647	INT-FETCH
314A	12618	STDE_U	2D8C	11660	P-INT-STO
314C	12620	STDE_S	2D8E	11662	INT-STORE
3160	12640	FP2BC	2DA2	11682	FP-TO-BC

## CHANS MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
139F	05023	CLOSE	16E5	05861	CLOSE
13AB	05032	RSTSTR	16EB	05867	(Make Strm Dt=0
13BE	05054	CLCHAN	1701	05889	CLOSE-2
1407	05127	(Clse Strm Tbl)	1716	05910	(Clse Strm Tbl)
140D	05133	(Close Strm Sub	171C	05916	CLOSE-STR
140F	05135	(Test Strm No.)	171E	05918	STR-DATA
142A	05162	OPEN	1736	05942	OPEN
1465	05221	OPCHAN	175D	05981	OPEN-2
14C7	05319	(Opn Strm Tbl)	177A	06010	(Opn Strm Tbl)
14CE	05326	(Open K Strm)	1781	06017	OPEN-K
14D2	05330	(Open S Stream)	1785	06021	OPEN-S
14D6	05334	(Open P Stream)	1789	06025	OPEN-P

## LIST MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
14E1	05345	LIST	1795	06037	AUTO-LIST
1541	05441	K_LLST	17F5	06133	LLIST
1545	05445	K_LIST	17F9	06137	LIST
15A1	05537	PUT_SR	1855	06229	OUT-LINE
15AC	05548	LPO	1860	06240	(LD D,0)
15C9	05577	PUT	187D	06269	OUT-LINE2
1602	05634	(Skip Over No.)	1886	06326	NUMBER
160D	05645	FLASHA	18C1	06337	OUT-FLASH
162D	05677	PR_CUR	18E1	06369	OUT-CURS
165B	05723	NEXT_L	190F	06415	LN-FETCH
1668	05736	DE_HL	191C	06428	LN-STORE
1671	05745	(Prnt Char/Tkn)	1925	06437	OUT-SP-2
1676	05750	(Add Spaces/No)	192A	06442	OUT-SP-ND
1683	05763	(Print Line)	1937	06455	OUT-CHAR
16D6	05846	FIND_L	196E	06510	LINE-ADDR
16E8	05864	CP_BC	1980	06528	CP-LINES
16F0	05872	SUBLIN	1988	06536	(Fnd Stmt Sub)
16F3	05875	SUBLN1	198B	06539	EACH-STMT
1720	05920	RECLEN	1988	06584	NEXT-ONE
1745	05957	(Dif of Length)	19DD	06621	DIFFER
174D	05965	DEL_DE	19E5	06629	RECLAIM-1
1750	05968	DELREC	19E8	06632	RECLAIM-2
1768	05992	LINENO	19FB	06651	E-LINE-ND
1788	06024	PUT_BC	1A1B	06683	OUT-NUM-1
1795	06037	PUT_LN	1A28	06696	OUT-NUM-2
17B5	06069	(Bank Switch Cd	----	----	-----
17CF	06095	GETAL	----	----	-----
17EA	06122	AR_LN	----	----	-----
17FF	06143	AR_NXT	----	----	-----
18C6	06342	ARDS	----	----	-----

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
3C65	15461	ROOT	384A	14410	SQR
3C6C	15468	TO_THE	3851	14417	TO-POWER

## TAPMSG MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
3C89	15497	SEPRMT	09A1	02465	(Cassette Msgs)
3CA9	15529	LDMES	09C1	02497	(Program: msg)

## CH\_SET MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
3D00	15616	CH_SET	3D00	15616	(Char Dot Ptrns)

## XBASIC MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
X000	X0000	XBASIC	----	-----	-----

## TAPE MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
X068	X0104	W_TAPE	04C2	01218	SA-BYTES
X0E5	X0229	W_BORD	053F	01343	SA/LD-RET
X0FC	X0252	R_TAPE	0556	01366	LD-BYTES
X189	X0393	RD_BIT	05E3	01507	LD-EDGE-2
X18D	X0397	R_EDGE	05E7	01511	LD-EDGE-1
X1AB	X0427	SLVM	0605	01541	SAVE-ETC
X58F	X1423	(Verify Command	07CB	01995	VR-CONTROL
X5C6	X1478	(Ld Data Block)	0802	02050	LD-BLOCK
X5CC	X1484	LOAD	0808	02056	LD-CONTRL
X6E5	X1765	MERGE	08B6	02230	ME-CONTRL
X851	X2129	SAVE	0970	02416	SA-CONTRL
X8AA	X2218	AKEY	15D4	05588	WAIT-KEY

## INIT MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
X8E7	X2279	EXINIT	----	-----	-----
X9F4	X2548	BLDSCT	----	-----	-----
XC4C	X3148	RESSCT	----	-----	-----

## CHNG\_VID MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
XDB0	X3504	OPDFIL	-----	-----	-----
XE27	X3623	CLDFIL	-----	-----	-----
XE8E	X3726	CHNG_V	-----	-----	-----

## PASSING MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
XF43	X3907	PASSIN	-----	-----	-----

## BS MODULE

HEX	DEC	TS2068 NAME	HEX	DEC	SPECTRUM NAME
XF8A	X3978	GOTO_B	-----	-----	-----
XF99	X3993	CALL_B	-----	-----	-----

\* The Timex 2068 Technical manual lists:

TSNAME HEX  
 DELSYM 0B7E  
 NEW 0D82  
 LDMES 3CAB

H.E. Weppler (Sep 85 CATS Newsletter) lists:

TSNAME HEX SPNAME HEX  
 DELSYM 0B7E (ED-DELETE ) 1016  
 NEW 0D82 (RAM-SET ) 1219  
 INPUT 222B (INPUT ) 208E  
 CALC 3684 (? STK-ZERO ) 3254  
 LDMES 3CAB (Program: Msg) 09C1

N.A. Pashtoon (May/June 88 SINCUS NEWS) lists:

TSNAME HEX SPNAME HEX  
 DEL\_K 0BFE (CLEAR-SP) 1097  
 LDMES 3CAB (Program: Msg) (09C1)  
 LINEND 1768 (E-LINE-ND) 19BF  
 PAUSE 1FEF (PAUSE) 1F3A  
 READ 1D96 (READ-3) 1DEC

For those of you who wish to operate or programme your machine a little more efficiently, we will carry informative articles as this one. To get full measure from Warren's effort, please use your computer and type in the simple demo programmes, verify what you read and test for other values. Try one new value at a time, and check your results, or try and guess what the computer will come up with first before you run it. Then it will truly become a learning experience for you.-Editor

### The Logic Operator, NOT

For many of us, computer logic is a bit difficult to understand, and articles like the one reputed to be by Sharon Z. Aker in the July '88 issue of UPDATE muddies the water more. On page 14, under the title of Priority, the article states that NOT B<C is interpreted as (NOT B)> C. This is wrong. NOT applies to the entire expression B<C as the < operator has a higher priority than NOT and the computer will evaluate B<C first. Look at page 228 of the manual for a priority listing.

NOT applied to a condition can result only in a logic value of 0 or 1, regardless of the appearance of the condition. For example, consider.....

NOT X = 50

This is interpreted by the computer as.....

NOT (X = 50)

If X does equal 50, the condition, X = 50, is TRUE and results in a logic value of 1 for this condition. Then NOT 1 has a logic value of 0.

Conversely, if X has a value of anything other than 50, the condition is considered FALSE, and X = 50 results in a logic value of 0. Then NOT 0, in turn, has a logic value of 1, and the THEN action will take place.

We can show this by a short test program.....

```
10 LET X = 50
20 IF NOT X = 50 THEN PRINT "Yes"
30 IF NOT (X = 50) THEN PRINT "OK"
40 PRINT "End Of Test"
```

Now change the value of X in Line 10 to anything but 50 and lines 20 and 30 will print out their strings. Why? Because X = 50 is not TRUE and its logic value becomes 0. Now, NOT 0 gives a logic value of 1. As the entire expression has a logic value of 1, the THEN action takes place.

The parenthesis in line 30 are not necessary, but if you wish to make the evaluation of an expression clear, use them. The computer simply ignores superfluous parenthesis, and evaluates X = 50 first because of the priority of the = operator.

Let's go a step further. The computer considers all logic on a numerical basis. To the computer, every logic term that is TRUE is assigned the number 1; otherwise it gets a 0. We can put this to a test by adding lines such as the following to our test program.....

```
15 PRINT X = 50
25 PRINT NOT X = 50
35 PRINT NOT (X = 50)
```

....and we will get nothing but the numbers 1 and/or 0, on a printout of these lines.

You can get the same response by evaluating a logic statement yourself and substituting the resulting logical value in the computer line. Instead of the line 20 as written above, write it as.....

```
20 IF 1 THEN PRINT "Yes"
```

.... and the computer will print the string. Change the 1 to 0 and the computer will not print the string. As we said before, the computer recognizes every thing but 0 as the number 1. So now use something like -3 in place of the 1. Again, the line will print out the string word.

If you get this concept of logic well established in your mind, you will have little or no trouble with logic NOT from here on in.

There is yet another way of treating logic NOT. You can change any expression wherein it appears to an equivalent one by recalling that it merely reverses logic TRUE and FALSE. In doing so, NOT drops out of the expression. So NOT X = 50 can be replaced by X <> 50. Shall we replace another? OK. NOT Y > 10 can be replaced by Y < = 10. I personally don't prefer this way of handling NOT because we tend to forget how the computer itself treats this unique operator.

Warren Fricke  
Western N.Y. Users Group.

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REVIEW - One of the more useful programs I have run across in the SINCUS tape swap library has been the title "Disk Library" by a member of the Sinclair Milwaukee User Group (SMUG). The programmer, R. A. Hilsmann has written a utility that is very helpful for disc drive users on the TS2068. I was a bit of a skeptic at first, having used without much luck other program file systems. This isn't to say that this worked bug free. No, there was an error in Updating files and deleting files, but a bit of a challenge gives one a sense of active participation with the program. The options include, Search, List, Delete, Update, Sort, Load, Print List, and Create a new Library. Then after getting the program to work, I then made a few changes to adapt to my disc system. Now on loading, the program starts right off with the search option, and with the files on the same disc it is a matter of seconds to locate the program, then insert the disc as indicated on your screen, and it will self load a program I know I have but cannot remember on which disc. Since my collection of programs is more static than dynamic, I am not using the change or update functions as much. Hilsmann has operating notes in the April 1988 SMUG issue, along with a printout of his program. It is available on cassette for \$5, from R.A. Hilsmann, POB 45, Menomonee Falls, WI 53051. It is designed for the Dliger system, but can be modified for others. Well worth the money as it will save you TIME.-P.A.H.

---

To date I have not had any more time to learn, run and review Larry Kenny's MAXCOM software. It is worth the money in just the terminal mode. It is disc interactive and you could down load 100K of data with no sweat. The BBS portion of the MAXCOM package takes some reading, and a little background in telecom terms. Some of the hangups were in learning how the password system was supposed to work. One part will work with 1200 baud and since I only got 300, I can not review that. I imagine the biggest problem a novice will have as did I, was comprehension of the documentation. There's a lot there, and finding a particular item usually meant rereading the whole doc.-P.A.H.



For those of you having problems with LOADING and SAVEing tape programs on your 2068 here's some thoughts from Don Lambert:

After having some problems verifying LOADED programs on a tape he was making, Don cleaned his 3 tape recorders and while waiting for the solvents to dry he read his mail from a friend in Canada. He found a paragraph in the letter which read: "Loading with the TS2068 often will not be successful in difficult cases when the computer has been on for a while and is hot. The solution is to turn it off for an hour or two and try again when it is cold. Also the TS2068 cassette system seems prone to problems with glitches, brown-out (power voltage drop) and too many accessories mounted on its power supply bus. This is particularly a problem with the cantankerous ZX-81 upload programs which load ZX-81 tapes at regular speed to convert the programs to TS2068 BASIC." This was from Bill Harmer, Ottawa, Ontario and his manuscript "Tips, Tricks and Techniques of the User Group Masters For the Sinclair ZX-81 / Timex TS1000".

Don goes on, "What this did was jolt my memory about a little known fact about the TS2068 and that is the cassette routines are effected by heat, or I should say the chip that does the routine is effected by heat. Normally, the voltage supplied to the computer is about 16 volts and inside the computer is a chip that reduces the voltage to an exact 5 volts, the difference is eleven volts and since it has to go somewhere it goes into heat and since the computer is poorly ventilated it gets hot inside and heat makes the SCLD chip get erratic. One cure is to cut the input voltage to 8.5 to 9 volts with the only loss being color. You need at least 12 volts for color. The problem is complicated by having the computer loaded off the rear expansion port with RAM boards, disc interfaces, modems, printer interfaces and what else might show up. They all use a little of the 5 volt power supply."

Using the tape that gave him problems, he loaded successfully in to spare 2068 with no addons on the expansion buss.

Another hint from Harmer, was that an audio transformer can be used to increase the voltage of a poor quality tape that sometimes a non LOADable tape can be LOADED. While he mentioned an 8 ohm to 1000 ohm transformer, I found a 500 to 1000 ohm unit and tried it out. Without the transformer and the recorder volume set at 8 it put out a signal of known strength and with the transformer hooked up, I had to cut the volume down to 5 to get the same signal level. So now I can increase the volume of weak signals on a tape."

I am also trying to find all the parts I picked up for the powersplitter project to keep the load off the 5 volt switching regulator inside the 2068. I have bigger heatsinks to put on the 7805 regulators...how big of a heat sink is required to dump about 7 volts at 570ma?

Other bits: if anyone has a Royal Letter Master printer they want to hook up to their 2068 with an Aerco printer interface -DONT- I tried it and it would not work, as the 7805 was shorting to ground. I made up a sh rt cable to go between the interface cable and the printer and cut the last line that Aerco had. It works now but it is S L O W.

Does any one have the instructions for a ZAD board, that Zebra used to make and sell? Also the Zebra C-130 Talker board and the Zebra VS101 board. Got these at the CapitalFEST and was promised doc, sent Zebra a SASE and still nothing. Will pay for copies if not excessive.

Don Lambert  
3310 Clover Drive S. W.  
Cedar Rapids, IA 52404

# SINCLAIR COMPUTER USERS SOCIETY

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Thanks to Ray Byler, Don Lamem, Don Lambert and Warren Fricke for their help with the input to this edition.

SINCUS DISC/tape SWAPS for the TS2068 are still growing- five discs available and the sixth under construction. Available in Oliger or Larken Formats ONLY in 40 track, 5.25" discs. Get all five for \$10.00, or \$2.50 per disc for orders less than 5 discs. Special deal- one swap disc for \$1.00 and three Public Domain programs (YOURS or outa a magazine and give credit where due- send for list of our programs, dupilcates don't count).

Send for disc catalogs, enclose an SASE. Send for a Sample disc and catalog enclose \$2.00.

For Oliger (DDDS 5.25" only) swaps write John Colonna, 28 Guilfoyle Ave., Binghamton, NY 13903.

For LKDOS (DDDS 5.25" only) swaps write to Paul Hill, 1229 Rhodes Rd., Johnson City, NY 13790. Make checks payable to SINCUS.

"CLONE"- a TS2068 tape copier (2 modes) and a header reader. On other side of tape are a couple swap samples. (TAPE ONLY) \$5. PPD.

COMPUTUS INTERRUPTUS- a multipart article on the 2068, includes programs, projects and artwork. Printed out, over 60 pages. One printed copy left only \$15 PP. Also available on LKDOS and Oliger discs - 5.25 DSDD only \$5. Make checks to SINCUS, write to Paul Hill, 1229 Rhodes Rd., Johnson City, NY 13790.

The new year will hold many possibilities for us TS users, but only if you make up your mind to contribute time and effort in your local user group, newsletter, or help SNUG with their projects. Get on your local BBS and seek out other TS users, unite, learn, teach and have fun!

**HAPPY NEW YEAR**